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(58) Field of Search

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(54) Illuminated display arrangements

(57) There is provided an elongate lighting tube 15 which is embedded in a transparent resin layer 14 on a glass sheet 13. An opaque resin layer 16 is then applied to the tube 15 and layer 14. The arrangement is held in a frame 11 using a beading 17. Clear, well defined displays are produced using this type of arrangement. Also the embedding protects the tube 15 from damage and dirt. The glass sheet 13 and the layers 14 and 16 may be clear or coloured. The lighting tube 15 may be gas filled; alternatively a fibre optic cable may be used.

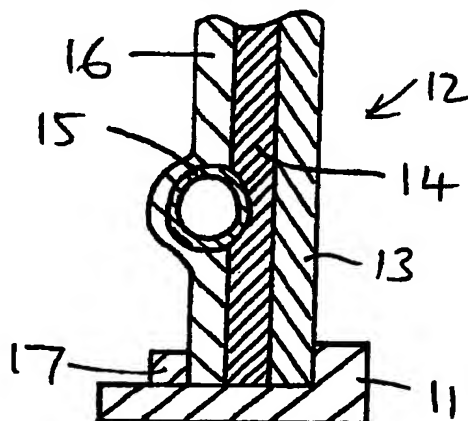


FIGURE 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

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FIGURE 1

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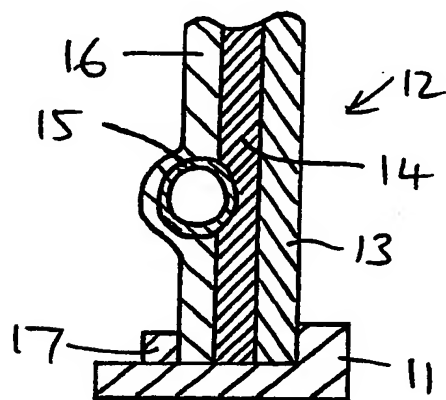


FIGURE 2

ILLUMINATED DISPLAY ARRANGEMENTS

This invention relates to illuminated display arrangements which incorporate elongate lighting members such as gas filled lighting tubes such as neon tubes, argon tubes.

5 According to the present invention there is provided an illuminated display arrangement comprising one or more portions of elongate lighting member and a retaining material, the or each portion of lighting member being at least partially embedded in said
10 retaining material.

 Preferably said retaining material retains said portion or portions of lighting member relative to a mounting element.

 In preferred arrangements said mounting
15 element is transparent or semi-transparent and said securing material is also transparent or semi-transparent. In such arrangements the rear of said transparent or semi-transparent material is preferably coated at least at predetermined locations with an
20 opaque material.

 Preferably said transparent or semi-transparent mounting element is a sheet of glass and said transparent or semi-transparent material is a cured resin. Conveniently said cured resin is clear.

25 In preferred arrangements the opaque material is a resin.

 With chosen embodiments different coloured resins are used over certain areas so as to produce pictures and/or words which are visible from the front
30 of the arrangements, certain sections being illuminated by virtue of the lighting members.

 In further embodiments the or each portion of lighting member is partially embedded with the central lengthwise extending axis of the lighting member
35 extending generally parallel to the glass sheet so

that the section of embedded lighting member has substantially parallel sides. The elongate lighting members are preferably gas-filled lighting tubes.

According to a second aspect of the present invention there is provided a method of constructing an illuminated display arrangement comprising the steps of

- (i) at least partially embedding one or more sections of elongate lighting member in a layer of a curable retaining material, and
- (ii) curing said material.

Preferably there is a further step of applying an opaque material to the exposed cured retaining material and maybe said one or more sections of lighting member. Conveniently the initial embedding step takes place on the rear of a transparent or semi-transparent mounting element.

Preferably said curable retaining material and said opaque material are resins and said transparent or semi-transparent mounting element is a sheet of glass.

Embodiments of the present invention will now be described in more detail. The description makes reference to the accompanying diagrammatic drawings in which:

Figure 1 shows an illuminated display arrangement according to the present invention viewed from the front, and

Figure 2 is a cross-section on line II-II of figure 1.

In the figures there is shown an illuminated display arrangement 10 comprising, in this example, a frame 11 and a display portion 12. The display portion 12 comprises a sheet of glass 13 which has a transparent resin layer 14 on its rear facing surface.

A neon or other gas filled tube 15 is partially embedded in the layer 14. An opaque resin layer 16 of any chosen colour or colours is then applied to the rear, exposed surfaces of the resin layer 14 and the tube 15. The glass sheet 13 and the attached resins may be held in the frame 11 by beading 17 or other suitable means.

It will be appreciated that the embedded areas will be illuminated by virtue of the lighting tubes, but the other areas will not be illuminated. Well defined displays can be produced using such a construction.

Display arrangements using this construction have a number of advantages. Firstly the glass tubes are protected by the resins from damage. Also the resins prevent the tubes from becoming dusty or dirty which is normally the case with neon light arrangements. In addition a good display is provided even when not viewed from a head-on position.

One simple method of making display arrangements is to rest the glass 13 in the frame 11 with the glass 13 substantially horizontal and facing downwards. A quantity of clear curing resin 14 is poured on to the glass sheet 13. A suitable arrangement of lighting tubes 15 are lowered into the resin so as to be partially embedded in the resin. If the arrangement of tubes is made and manoeuvred carefully then the central lengthwise axes of the tubes can be maintained generally perpendicular to the glass so as to produce embedded areas having neat, parallel boundaries.

The resin 14 is then cured so that the tubes 15 are fixed in the clear resin 14. A second resin layer 16 is then applied to the exposed backs of the tubes and to the upward facing surfaces of the resin

14. The resin layer 16 may be a single coloured resin or could be a pattern or picture of various colours. Those areas of the resin 16 between adjacent tubes 15 and between the tubes 16 and the frame 11 being
5 visible from the front in the finished display.

It will be appreciated that any arrangements of tubes can be accommodated in a single design and the illuminated colours of the tubes can vary as desired. Also, the glass sheet 13 could be semi-
10 transparent or coloured, as could the resin layer 14. Other materials instead of glass could be used for the panel 13 and the panel need not be flat. It may also be possible to use materials other than resins to form layers 14 and 16, such as thermo setting plastics and
15 polymers. Examples of suitable materials for layers 14, 16 are polymer resins such as polystyrene, polyethylene, polyurethane and polyester, epoxy resins, silicone gels and resins such as silicone elastomers and silicone dielectric gels, latex and
20 plasticised gums. Other materials may also be possible. Furthermore, instead of lowering the tubes 15 into the layer 14, the resin could be applied to the glass 13 with the tubes already positioned.

Although gas-filled tubes are discussed above
25 it will be appreciated that other elongate lighting members can be used. An example of a suitable member is a fibre optic cable which emits light radially as well as transmitting it along its length.

It is also envisaged that simple arrangements
30 could be made by applying resin to a mounting element and then embedding the gas-filled tubes in the resin before it has cured. Words, designs or pictures may be formed on the mounting element and covered with a clear resin for embedding the tubes. Alternatively
35 the words, designs or pictures could be made with

coloured resins in which the tubes are subsequently
embedded. Such arrangements would be viewed from the
tube side of the mounting element. Also it would be
necessary for the tubes to be in a single plane unless
5 a deep layer of resin is used.

In another arrangement the lighting tubes
could simply be embedded in a resin, perhaps using a
sheet of glass as a mould which is then removed. An
opaque layer could be applied as desired to the rear
10 or omitted altogether.

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CLAIMS

- 5 1. An illuminated display arrangement comprising one or more portions of elongate lighting member and a retaining material, the or each portion of lighting member being at least partially embedded in said retaining material.
- 10 2. An arrangement as claimed in claim 1 wherein said retaining material retains said portion or portions of lighting member relative to a mounting element.
- 15 3. An arrangement as claimed in claim 2 wherein said mounting element is transparent or semi-transparent.
- 20 4. An arrangement as claimed in claim 3 wherein said securing material is also transparent or semi-transparent.
- 25 5. An arrangement as claimed in claim 4 wherein the rear of said transparent or semi-transparent material is preferably coated at least at predetermined locations with an opaque material.
- 30 6. An arrangement as claimed in claim 5 wherein said transparent or semi-transparent mounting element is a sheet of glass.
- 35 7. An arrangement as claimed in claim 6 wherein said transparent or semi-transparent material is a cured resin.
8. An arrangement as claimed in claim 7 wherein said

cured resin is clear.

9. An arrangement as claimed in any one of claims 5 to 8 wherein the opaque material is a resin.
- 5 10. An arrangement as claimed in claim 9 wherein different coloured resins are used over certain areas so as to produce pictures and/or words which are visible from the front of the arrangements, certain sections being illuminated by virtue of the lighting members.
- 10 11. An arrangement as claimed in any one of claims 6 to 10 wherein the or each portion of lighting member is partially embedded with the central lengthwise extending axis of the lighting member extending generally parallel to the glass sheet so that the section of embedded lighting member has substantially parallel sides.
- 15 12. An arrangement as claimed in claim 11 wherein the elongate lighting members are preferably gas-filled lighting tubes.
- 20 13. A method of constructing an illuminated display arrangement comprising the steps of (i) at least partially embedding one or more sections of elongate lighting member in a layer of a curable retaining material, and (ii) curing said material.
- 25 30 14. A method as claimed in claim 13 wherein there is a further step of applying an opaque material to the exposed cured retaining material.

15. A method as claimed in claim 14 wherein the initial embedding step takes place on the rear of a transparent or semi-transparent mounting element.

5 16. A method as claimed in claim 15 wherein said curable retaining material and said opaque material are resins and said transparent or semi-transparent mounting element is a sheet of glass.

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